

# **SUGGESTIVE QUESTION BANK**

## **B.Voc. in Food Processing**

### **Semester – I**

#### **FOOD CHEMISTRY (BVFPS105T)**

##### **UNIT-I**

**Water- Introduction to food chemistry- Definition, scope and importance, structure of water molecule, hydrogen bonding, effect of hydrogen bonding on the properties of water, moisture in foods, free water, bound water, water activity, estimation of moisture in foods, determination of moisture and water activity.**

2 mark

1. Define free bound water.
2. What is entrapped water?
3. What is water activity?
4. Define Drinking water.
5. Define mineral water.
6. How will you express hardness?
7. How will you remove temporary hardness?
8. What is the reason for permanent hardness?
9. What are the disadvantages involved in using hard water?
10. Why hard water is not used for washing clothes?
11. Why does ice float on water?
12. List the unusual properties of water.

5 mark

1. Distinguish between the reasons of temporary hardness and permanent hardness.
2. Write notes on hard water and soft water.
3. Explain physical properties of water.
4. Write notes on drinking water.
5. Write notes on free bound and entrapped water.
6. Explain temporary hardness and permanent hardness.
7. Write notes on drinking water and mineral water.
8. Write the role of hydrogen bonding in water.
9. Why rivers do not freeze from the bottom up?
10. Define the following terms. a) Hard water b) Soft water c) Portable water.
11. How can a reduced  $a_w$  help extend the shelf life of foods?
12. What is hard water? How can you remove temporary hardness of water?

13. Define high moisture, intermediate moisture and low moisture foods in terms of moisture content.
14. What is the correlation between moisture content and storage shelf-life of food?
15. The bond angle of a single water molecule is very close to the angle of a perfect tetrahedron. How is this explained?
16. Define heat of fusion, specific heat capacity and latent heat of vapourization of water.

10 mark

1. Write an essay on treatment of domestic water supply.
2. Give a detailed account on chemical and physical properties of water.
3. Write an essay on water quality for food processing.
4. Write an essay on temporary hardness and permanent hardness.

## UNIT-II

**Carbohydrates Nomenclature, composition, sources, structure, reactions, functions, classification - monosaccharide, disaccharides, oligosaccharides and polysaccharides. Properties of Starch – gelatinisation, gel formation, syneresis, starch degradation, dextrinization, retrogradation, Qualitative and quantitative tests of carbohydrates.**

1. Define carbohydrates. 2
2. Write the composition of carbohydrates. 3
3. Discuss shortly the source and function of carbohydrates. 4
4. Define monosaccharide with a suitable example. 2
5. Define disaccharide with a suitable example. 2
6. Define oligosaccharide with a suitable example. 2
7. Define polysaccharide with a suitable example. 2
8. Briefly discuss gelatinization. 5
9. Briefly discuss retrogradation. 4
10. Write the difference between gelatinization and retrogradation. 4
11. Write a short note on dextrinization. 4
12. What do you mean qualitative quantitative tests of carbohydrate? Explain it with your own words? 5

## UNIT-III

**Proteins Nomenclature, sources, structure, functions, classification - essential and non-essential amino acids, Physical and chemical properties of proteins and amino acids, functional properties - denaturation, hydrolysis, changes in proteins during processing. Enzymes - criteria for purity of enzyme, Specificity, mechanism of enzyme action, factors influencing enzymatic activity, controlling enzyme action, enzymes added to food during**

**processing, Browning reaction- Enzymatic and non enzymatic browning, advantages and disadvantages, factors affecting their reaction and control.**

1. What do you mean proteins with a suitable example? 2
2. What is the source and function of protein. 3
3. Briefly discuss the classification of protein. 3
4. Write the difference between essential and non-essential amino acids. 3
5. Define amino acid. 2
6. Briefly discuss physical and chemical properties of protein. 4
7. Write a short note on protein denaturation. 3
8. Write a short note on protein hydrolysis. 3
9. Define enzyme. 2
10. What do you mean enzyme specificity? 2
11. What is the factors effect on enzyme specificity? 3
12. Write a short note on mechanism of enzyme action. 4
13. What do you mean factors effecting enzyme activity?4
14. Define controlling enzyme action. 3
15. Write the name of enzymes which added to food during processing. 2
16. What do you mean browning reaction. 3
17. Write a short note on enzymatic browning and non-enzymatic browning. 3
18. Write a difference between enzymatic browning and non-enzymatic browning. 4
19. Write the advantages and disadvantages of browning reaction. 3
20. Define factors effecting browning reaction. 4
21. Discuss briefly changes in protein during processing. 5

**UNIT-IV**

**Fats and oils Nomenclature, composition, sources, structure, functions, classification, essential fatty acids. Physical and chemical properties - hydrolysis, hydrogenation, rancidity and flavour reversion, emulsion and emulsifiers, saponification value, acid value and iodine value, Reichert-Meissl number, Polenske value, smoke point. Lipids of biological importance like cholesterol and phospholipids**

1. What do you mean fat? 2
2. Define structure of fat. 3
3. Write the composition of fat. 3
4. Write the source and function of fat. 4
5. Briefly discuss the classification of fat. 3
6. Write a short note on essential fatty acids. 3
7. Write a short note on fat hydrolysis. 4
8. Define hydrogenation of fat. 4
9. What do you mean emulsion and emulsifier? 3

10. What do you mean saponification value? 2
11. Define acid value and iodine value. 4
12. What do you mean smoke point? 2
13. Define Reichert-Meissl number. 2
14. Write a short note on Cholesterol and phospholipids. 5
15. Define polenske value. 2

## UNIT-V

### **Minerals and Vitamins Minerals and Vitamins: Sources and structures of minerals & vitamins; Effect of processing and storage of vitamins, Pro vitamins A & D; Vitamins as antioxidants.**

#### **2 marks**

1. What is beriberi?
2. What are two active forms of niacin?
3. What are the two coenzyme derivatives of riboflavin?
4. Name the active form of vitamin Bs that occurs in our body.
5. Which compounds/conditions lead to the destruction of vitamin E?
6. What is a Corrin ring system?
7. Write down the chemical name of vitamin A. What factors lead to its destruction?
8. Which vitamin is required for normal reproduction? List a few foods rich in the vitamin.
9. Of the vitamins B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub>, which is the most stable one?
10. Name the compound that is structurally similar to retinol and can be easily converted to vitamin A.
11. What are the two rings present in the structure of thiamine?
12. What is an important property of vitamins B<sub>1</sub> and B<sub>2</sub> which is crucial from the point of view of cooking?
13. What is the chemical nature of niacin? Which disease is caused by its deficiency?
14. Name two functional groups (present in the structure) of vitamin B<sub>5</sub>.
15. How many types of tocopherols are commonly found in nature? Out of these which one is most potent as a vitamin?
16. What is menadione? Is it available in the nature?
17. What are the two related compounds of pyridoxine? How are these different from pyridoxine?
18. Write down the name of the vitamin that contains a metal in the structure.
19. Name a few compounds or conditions which can cause the destruction of vitamin B<sub>12</sub>.
20. Define minerals.

#### **5 marks**

1. Explain mineral & vitamin content of foods.
2. What is the difference between fat-soluble and water soluble vitamins? Name four fat-soluble vitamins.

3. Indicate the steps involved in the formation of vitamin D.
4. What is the chemical nature of vitamin K? List the physiological functions of the vitamin.
5. Which vitamin is required for normal vision? Why beta-carotene is called pro-vitamins A? List a few foods rich in beta-carotene.
6. List any two properties of vitamin D to indicate that it is much more stable vitamin than vitamin A.
7. What is the chemical nature of ascorbic acid? Why it has reducing property? List a few foods rich in ascorbic acid.
8. Name the commonest form of vitamin D? How does its structure differ from other members of the group?
9. Compare and contrast any two physico-chemical properties of vitamin K<sub>1</sub> and K<sub>2</sub>.
10. Write down the structure of nicotinamide and L-ascorbic acid.
11. Give important physico-chemical properties of Vitamin C.
12. Which minerals are required for the formation of bones and teeth? List a few dietary sources for the minerals.
13. Which diseases are caused by the deficiency of iodine and fluorine?
14. Enumerate the importance of iron and cobalt in human.
15. What is the chemical name of vitamin K? What are the roles of vitamin A in human body?

**10 marks**

1. Draw structure of vitamin A. What role it plays in human body
2. Explain chemistry and importance of all B-complex vitamins.
3. What are vitamins? List a few characteristics which all vitamins possess.
4. What are the two active forms of vitamin A? What is their physiological role in the body?
5. What are the roles of vitamin B<sub>12</sub> in the human system? List a few dietary sources of the vitamin.
6. Which member of the vitamin K group is synthesized by bacteria? What is its chemical name? How is it structurally different from rest of the members?